

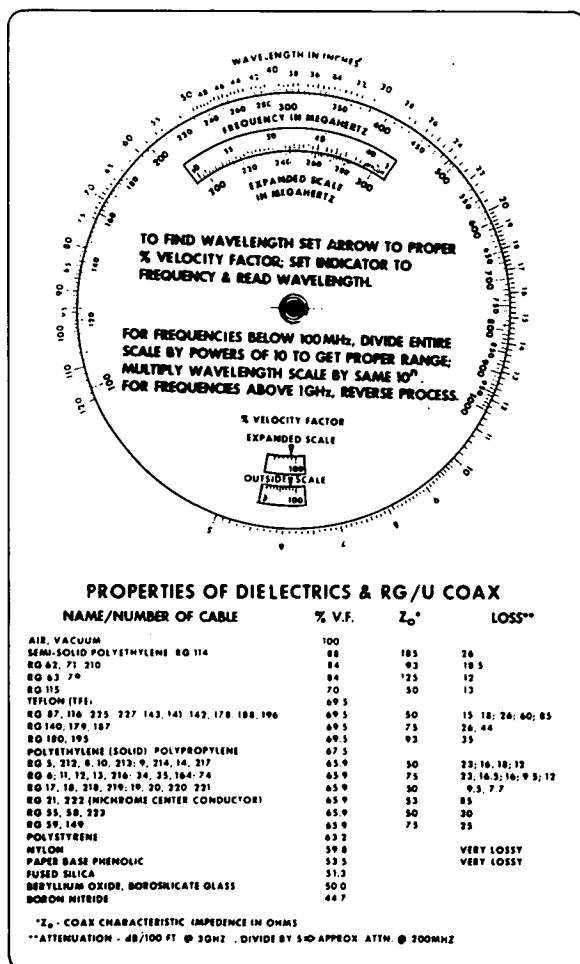
NASA TECH BRIEF

Goddard Space Flight Center



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Frequency-Wavelength Calculator with Table of Dielectric Properties



A frequency-wavelength calculator has been developed which rapidly and accurately calculates wavelength of a given frequency in a specific dielectric material. The unit fits into a shirt pocket and includes a table of dielectric properties and a one-step calculator.

Previous methods all entailed referencing a table of dielectric-velocity factors and then performing a multi-step calculation either by hand, a slide rule, or a desk calculator.

The new calculator, as shown in the figure, has a wheel which is free to rotate about its central mounting on a backing card. The wavelength and velocity-factor scales plus a table of properties for common dielectrics and coaxial cables are printed on the backing card. The wheel bears the frequency scale and has a window cutout with an arrow indicator which aligns with the appropriate dielectric-velocity factor. In addition, a cursor rotates about the center of the wheel.

The arrow indicator is set to the proper velocity factor, as selected from the table. The wavelength and the frequency appear directly opposite each other and can be read using the hairline on the cursor.

The scales on the calculator are circular logarithmic and are designed to minimize interpolations of powers of 10 for a limited range of velocity factors which are satisfactory for most common materials. Other calculator designs can be larger in size, include all the possible velocity factors, and display wavelength in metric units.

(continued overleaf)

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Note:

No additional documentation is available. Specific questions, however, may be addressed to:

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No patent action is contemplated by NASA.

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